

Dimensional and Accuracy Control Automation Phase I and II

Status: Transitioned

PROBLEM / OBJECTIVE

As much as 30 percent of the total labor costs for fabrication of a Navy ship can be attributed to rework necessary to compensate for poor fit up due to dimensional inaccuracies of components and structures. Development of new tools to improve dimensional accuracy will significantly reduce the cost of ship fabrication and assembly.

The objective of this project is to develop an integrated, automated accuracy control system combining photogrammetry with computer analysis tools to enable Bath Iron Works (BIW) and Northrop Grumman Ship Systems (NGSS) to improve the accuracy control of fabrication processes and result in neat construction of ship units in time for production of the DD(X).

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

This project developed an automated Structural Measurement and Analysis System that combines digital photogrammetry with computer databases and analysis tools that automate the collection, analysis, and archiving of structural measurement data for thermal plate cutting and panel fabrication processes. These automated computer methods permit shipyard personnel to determine the cause and effect of material, design, construction or process variables on observed variations from required part dimensions. The system also performs statistical analysis and compares new data with prior data to identify problems, errors and trends.

Implementation and Technology Transfer:

BIW has installed the developed Structural Measurement & Analysis System into plate cutting production operations at their Hardings Facility to provide a comprehensive system to improve the shipyard's ability to measure and control thermal cutting operations.



Expected Benefits:

This project will benefit the DD(X) program by reducing acquisition costs and providing the warfighter with a ship with an improved signature and reduced life-cycle maintenance, all due to improved accuracy and consistency of ship structures. Improved accuracy will reduce ship labor costs for fabrication and assembly by up to 30 percent. Phase II of this project is expected to yield an estimated cost avoidance of \$252K per hull and a total net present value cost avoidance of \$1.8M over 5 years. Improving the accuracy of thermally cut plate products will reduce labor in welded panel assemblies, in subsequent ship fitting activities, and unit erection.

TIME LINE / MILESTONE

Start Date: July 2001

End Date: June 2004

FUNDING

Phase I and II

ManTech Investment: \$643K

Industry cost share: \$444K

PARTICIPANTS

Edison Welding Institute (EWI)

Bath Iron Works A General Dynamics Company

Northrop Grumman Ship Systems

NAVSEA